IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Bonnie B. Sandel et al.	Docket:	102289-100
Serial No.:	10/722,928	Art Unit:	1611
Filed:	November 26, 2003	Examiner:	Frazier, Barbara S.
Assignee:	Arch Chemicals, Inc.	Conf. No.	1181
Title:	ANTIMICROBIAL PROTECTION FOR PLASTIC STRUCTURES		

APPEAL BRIEF UNDER §41.37(c)

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is an appeal from Advisory Action dated January 13, 2009, and Notice of Panel Decision from Pre-Appeal Brief Review dated April 3, 2009, in which claims 1-6, 8-15 and 33 of the above-identified application were finally rejected.

Please charge the amount of $ 510.00 to Wiggin and Dana's Deposit Account No. 23-1665 to cover the filing fee for this Appeal Brief. Additionally, please charge the amount of $ 490.00 for a two (2) month extension of time. If there are any charges associated with this Appeal Brief, please charge them to Deposit Account No. 23-1665.

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Date: July 6, 2009

Wanli Wu

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I. REAL PARTY IN INTEREST

The real party in interest for the above-identified application is Arch Chemicals, Inc.

II. RELATED APPEALS AND INTERFERENCES

Appellants state that there are no known appeals and interferences related to this application.

III. STATUS OF CLAIMS

Claims 1-6, 8-15 and 33 are currently pending and have been finally rejected. Claims 7 and 16-32 are withdrawn from consideration due to restriction/election requirements imposed by the Examiner. The claims herein appealed are claims 1-6, 8-15 and 33. A copy of the presently appealed claims is provided in the Claims Appendix attached hereto.

IV. STATUS OF AMENDMENTS

A Reply to a Final Office Action was filed on December 29, 2008. In that Reply, no amendments were submitted and no new claims were added. Arguments in favor of allowance of claims 1-6, 8-15 and 33 were presented. An Advisory Action dated January 13, 2009 indicated that the Reply filed on December 29, 2008 fails to place this application in condition for allowance. A notice of appeal was filed on March 2, 2009. A Request for Pre-Appeal Brief Review was filed on March 2, 2009. A Notice of Panel Decision from Pre-Appeal Brief Review indicated that claims 1-6, 8-15 and 33 remain rejected.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The claimed subject matter as recited in independent claim 1 relates to a process for incorporating a metal salt of an antimicrobial onto an outer surface of, or into a porous inner portion of, an extruded or molded plastic product. The process includes the steps of:

(a) extruding or molding a metal-containing plastic-forming composition in an extruder or a mold at an elevated temperature to provide a metal-containing extruded or molded product,

(b) contacting the extruded or molded product from step (a) with an aqueous solution of a water-soluble biocide in order to cause the water soluble biocide to react or chelate with at least a portion of the metal on an outer surface, or in a porous inner portion, of the warm extruded or molded product, thereby forming an antimicrobially protected plastic product having a water-insoluble metal salt of a biocide on the surface, and/or in the porous inner portion, thereof.

Support for this claim can be found at p. 8, lines 7 - 22 of the instant specification.

The claimed subject matter as recited in independent claim 33 relates to a process for incorporating a metal salt of an antimicrobial into a porous inner portion of, an extruded or molded plastic product. The process comprises the steps of: (a) extruding or molding a metal-containing plastic-forming composition in an extruder or a mold at an elevated temperature to provide a metal-containing extruded or molded product, (b) contacting the extruded or molded product from step (a) with an aqueous solution of a water-soluble biocide in order to cause the water soluble biocide to react or chelate with at least a portion of the metal in a porous inner portion, of the warm extruded or molded product, thereby forming an antimicrobially protected plastic product having a water-insoluble metal salt of a biocide in the porous inner portion, thereof.

Support for this claim can be found at p. 8, lines 7-22, as well as p. 15, lines 1-5 of the instant specification.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-6, 8-15 and 33 stand finally rejected under 35 USC 103(a) as allegedly being obvious over Laver, U.S. Patent 5,516,472, Dawson-Andoh et al., Abstract from Vinyltec 2003 Conference, and Lyon et al., U.S. Patent 6,042,877.

Appellants respectfully submit that this rejection is untenable and should be withdrawn.

VII ARGUMENT

The instantly claimed invention relates to a process for incorporating a metal salt of an antimicrobial onto an outer surface, or into a porous inner portion, of an extruded or molded plastic product. The process includes the steps of extruding or molding a metal-containing plastic-forming composition in an extruded or molded product, and contacting the extruded or molded product with an aqueous solution of a water-soluble biocide in order to cause the water-soluble biocide to react or chelate with at least a portion of the metal on an outer surface, or in a porous inner portion, of the warm extruded or molded product, thereby forming an antimicrobially protected plastic product having a water-insoluble metal salt of a biocide on the surface, and/or in the porous inner portion, thereof.

The outstanding Office Action cited Laver, Dawson-Andoh et al. and Lyon et al. in rejecting the instant claims. Laver discloses an extrusion process for combining an organic fibrous material with a thermoplastic material to form a wood-imitating composite (Abstract). Laver discloses further that the product may contain lubricants such as zinc stearate. The product produced by the process disclosed in Laver is not antimicrobially protected.

Dawson-Andoh et al. discloses that rigid PVC-wood flour composite lumber containing either maple or pine wood flour was colonized and discoloured by fungi. However, Dawson-Anhoh et al. does not provide any solution to the problem.

Lyon et al. discloses a two-step methodology for imparting antimicrobial efficacy to a variety of products. The method includes the steps of: (1) coating the article with a solution containing a complex of a chelating polymer and a metal ion and (2) treating the coated article with an antimicrobial solution (Abstract as well as column 3, lines 1 and 2).

The outstanding Office Action asserts that in view of the disclosure of Dawson-Andoh et al, a person skilled in the art would recognize the need to apply a biocide to the extruded product of Laver. Then the Office Action **selectively** applies only step (2) of Lyon's two-step

methodology to the wood composite produced by the Laver et al. process and alleges that the combination produces the instantly claimed invention.

Applicants respectfully submit that the combination as applied by the Office Action is improper because such combination ignores one of the two-steps mandated by Lyon's disclosed methodology, namely, coating the article with a solution containing a complex of a chelating polymer and a metal ion. To ignore that step runs counter to the specific teachings of Lyon et al.

As discussed above, Lyon et al. disclose a two step process to protect an article. Specifically, Lyon et al. discloses that the article is first treated with a solution containing a complex of a metal ion and a chelating polymer, which upon drying, forms a layer of film coated on the surface of the article. (Col. 3, lines 1-4 as well as col. 4, lines 37-39). Accordingly to Lyon et al., suitable polymers include polyglucosamine (also referred to as chitosan), ethylene acrylic acid copolymer, polycarboxylic acid, alkyleneimines and polyamine. (Col. 3, lines 4-8)

Lyon et al. discloses further that after the article is dried, it is treated with another solution containing a potentiator, namely, an anti-microbial agent capable of bonding to the metal ion. (col. 4, lines 56 and 59). According to Lyon et al., to maintain sustained antimicrobial activity, it is desirable if the potentiator only partially displace the bonds between the metal ion and the chelating polymer (col. 4, lines 59-65).

Upon reading the disclosure, a person of ordinary skill in the art would readily understand that after the second-step of the two-step process, one or more bonds between the metal ion and the chelating polymer still exist (not completely replaced), while at the same time, a new bond(s) is formed between the metal ion and the potentiator. Accordingly, a "chelating polymer – metal ion – potentiator" complex is formed on the surface of the treated article.

Indeed, Applicants respectfully submit that Lyon et al. exemplifies that not only is a "chelating polymer – metal ion – potentiator" complex formed, but also it is this complex that confers antimicrobial activity to the finished product.

At column 2, lines 26-28 of Lyon et al., patentee states that it provides a method for the application of an antimicrobial complex to a variety of substrates. Lyon et al. states further that this complex is chitosan-based, and in particular a chitosan-metal-pyrithione complex. See column 2, lines 28-32. According to Lyon et al., chitosan is a preferred chelating polymer. See column 3, lines 6-8. And pyrithiones are suitable potentiators. See column 5, lines 7-8. Therefore, Lyon et al. discloses the formation of a "chelating polymer-metal ion-poentiator" complex.

At column 2, lines 32-37, Lyon et al. discloses that a chitosan-metal-pyrithione complex can be applied to a substrate surface to provide the finished article and the like with antimicrobial properties that will withstand repeated uses of the article even after significant water exposure. Accordingly, Lyon et al. discloses that chitosan-metal-pyrithone complex, i.e., a "chelating polymer-metal ion-potentiator" complex confers antimicrobial activity.

In view of the above-mentioned disclosures, a combination of the relevant teachings of Laver et al. and Lyon et al. at all, would suggest applying the Lyon et al. process as a whole to the composite disclosed by Laver and arrive at a process wherein a metal-chelating polymer is added to the product after the product is formed in order to facilitate the formation of an antimicrobial complex – "chelating polymer – metal ion – potentiator" on the product's surface. Otherwise, if step (2) of the process disclosed in Lyon et al. is selectively applied to the extruded product disclosed by Laver, no chelating polymer-metal ion-potentiator complex would form, because in the extruded product disclosed by Laver, zinc is presented as a zinc salt, namely, zinc stearate, not a zinc-chelating polymer complex disclosed in Lyon et al. This would be contrary to the teaching of Lyon et al. that such complex is required to provide a sustaining antimicrobial efficacy. In addition, as discussed in detail above, to ignore one of the two steps mandated by Lyon et al.'s disclosure runs counter to the specific teachings of Lyon et al. Accordingly, Applicant respectfully submit that the combination is improper.

Applicants submit that there is no proper motivation to combine the teachings of cited references while selectively ignoring a specific teaching of one of the references. Moreover,

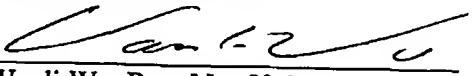
Applicants submit that absent of using impermissible hindsight reasoning with full knowledge of the present invention, even if the teachings of Lyon et al. and Laver were combined, the combined references would not disclose or suggest the instantly claimed invention, but rather one wherein forms an antimicrobial "chelating polymer – metal ion – potentiator" complex on the surface of the article to be treated.

In view of the foregoing, withdrawal of the outstanding rejections and allowing all the claims are respectfully requested.

CONCLUSION

Appellant respectfully requests that the Board of Appeals reverse the outstanding rejections under 35 U.S.C. § 103 of instant claims 1-6, 8-15 and 33 on appeal. Any fees due with this Reply may be charged to Deposit Account **23-1665** under Customer Number **27267**.

Respectfully submitted for
Bonnie B. Sandel et al.



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VIII. CLAIMS APPENDIX

1. (Original) A process for incorporating a metal salt of an antimicrobial onto an outer surface of, or into a porous inner portion of, an extruded or molded plastic product which comprises the steps of:

(a) extruding or molding a metal-containing plastic-forming composition in an extruder or a mold at an elevated temperature to provide a metal-containing extruded or molded product,

(b) contacting the extruded or molded product from step (a) with an aqueous solution of a water-soluble biocide in order to cause the water soluble biocide to react or chelate with at least a portion of the metal on an outer surface, or in a porous inner portion, of the warm extruded or molded product, thereby forming an antimicrobially protected plastic product having a water-insoluble metal salt of a biocide on the surface, and/or in the porous inner portion, thereof.

2. (Original) The process of claim 1 wherein the water-soluble biocide is selected from the group consisting of pyrithiones, 2-hydroxypyridine N-oxide, N-nitroso-N-cyclohexyl hydroxylamine, 8-hydroxyquinoline, thiocarbamates, dithiocarbamates, and combinations thereof.

3. (Original) The process of claim 1 wherein the water-soluble biocide is a pyrithione selected from the group consisting of pyrithione acid, sodium pyrithione, potassium pyrithione, pyrithione disulfide magnesium sulfate, and combinations thereof.

4. (Original) The process of claim 1 wherein the metal is selected from the group consisting of calcium, zinc, iron, copper, silver, titanium, manganese, and combinations thereof.

5. (Original) The process of claim 1 wherein the metal is present as an oxide, hydroxide, carbonate, borate, silicate, chloride, sulfate, stearate, laurate, or combination thereof.

6. (Original) The process of claim 4 wherein the metal is present on the surface, and/or in the porous interior portion, of the extruded product in an amount of from about 0.01 g/m^2 to about 20 g/m^2, based upon the outer surface area, or porous interior portion, of the extruded or molded plastic product.

7. (Withdrawn) The process of claim 4 wherein the metal is calcium, and the calcium is present on the surface of or in the porous structure of the extruded product, in an amount of from about 0.01 g/m^2 to 100 g/m^2 based upon the surface area of the extruded plastic.

8. (Original) The process of claim 4 wherein the metal is zinc, and the zinc is present on the surface of, or in the porous interior portion of the molded or extruded product, in an amount of from about 0.01 g/m^2 to about 20 g/m^2 based upon the surface area of the plastic structure.

9. (Original) The process of claim 1 where the water-insoluble metal biocide has a water solubility of 0.05 mg/L to 10 g/L.

10. (Original) The process of claim 1 where the water-insoluble metal biocide has a water solubility of 0.05 mg/L to 1000 mg/L.

11. (Original) The process of claim 1 where the water-insoluble metal biocide has a water solubility of 0.05 mg/L to 100 mg/L.

12. (Original) The process of claim 1 where the water-insoluble metal biocide has a surface concentration of about 0.01 g/m^2 to about 20 g/m^2 based upon the total surface area of the extruded or molded plastic product.

13. (Original) The process of claim 1 where the plastic-forming composition comprises a virgin or recycled resin suitable for extruding or molding selected from the group consisting of virgin or recycled polyethylene, polypropylene, polyallomer, polyacetal, polyamide, polyester, polystyrene, polycarbonate, polyurethane, acrylonitrile–butadiene-styrene ("ABS"), polyvinylchloride, polyvinylfluoride, ethyl-vinyl acetate co-polymer, and combinations thereof.

14. (Original) The process of claim 13 wherein the polyethylene is virgin or recyled selected from the group consisting of low density polyethylene ("LDPE"), high density polyethylene ("HDPE"), and combinations thereof.

15. (Original) The process of claim 1 where the molded or extruded plastic product or plastic-forming composition additionally comprises at least one cellulosic filler selected from the group consisting of wood chips, wood fibers, wood flour, wood dust, newspaper, rice hulls, straw, peanut shells, alfalfa, cotton, jute and combinations thereof.

16. (Withdrawn) The process of claim 1 wherein the molded or extruded plastic product or plastic-forming composition additionally comprises reinforcing fibers selected from the group consisting of glass fibers, carbon fibers, polyester fibers, nylon and aramid fibers, cellulosic fibers and combinations thereof, thereby providing a reinforced plastic product.

17. (Withdrawn) An antimicrobially protected, metal-containing plastic structure produced by reacting or chelating at least a portion of said metal with a water-soluble biocide to form a water-insoluble metal salt of biocide on an outer surface of the article, or into a porous interior portion of the article, said water-insoluble metal salt of the biocide exhibiting a slow release rate of biocide from the surface or interior portion of the article, as compared to the release rate for the water-soluble biocide.

18. (Withdrawn) The plastic structure of claim 17 wherein the water-soluble biocide is selected from the group consisting of pyrithione, 2-hydroxypyridine N-oxide, N-nitroso-N-cyclohexyl hydroxylamine, 8-hydroxyquinoline, thiocarbamates, dithiocarbamates, and combinations thereof.

19. (Withdrawn) The plastic structure of claim 17 wherein the water-soluble biocide is a pyrithione selected from the group consisting of pyrithione acid, sodium pyrithione, potassium pyrithione, pyrithione disulfide magnesium sulfate, and combinations thereof.

20. (Withdrawn) The plastic structure of claim 17 wherein the metal is selected from the group consisting of calcium, zinc, iron, copper, silver, titanium, manganese, and combinations thereof.

21. (Withdrawn) The plastic structure of claim 17 wherein the metal is present as an oxide, hydroxide, carbonate, borate, silicate, chloride, sulfate, stearate, laurate, or combination thereof.

22. (Withdrawn) The plastic structure of claim 17 wherein the metal is present on the surface of the extruded or molded product, in an amount of from about 0.01 g/m^2 to about 20 g/m^2 or more, based upon the surface area of the extruded plastic.

23. (Withdrawn) The plastic structure of claim 17 wherein the metal is calcium, and the calcium is present on the surface of or in the porous structure of the extruded product, in an amount of from about 0.01 g/m^2 to 100 g/m^2 based upon the surface area of the extruded plastic.

24. (Withdrawn) The plastic structure of claim 17 wherein the metal is zinc, and the zinc is present on the surface of, or in the porous interior portion of the molded or extruded product, in an amount of from about 0.01 g/m^2 to about 20 g/m^2 based upon the surface area of the plastic structure.

25. (Withdrawn) The plastic structure of claim 17 where the water-insoluble metal biocide has a water solubility of 0.05 mg/L to 10 g/L of water.

26. (Withdrawn) The plastic structure of claim 17 wherein the water-insoluble metal biocide has a water solubility of 0.05 mg/L to 1000 mg/L of water.

27. (Withdrawn) The plastic structure of claim 17 wherein the water-insoluble metal biocide has a water solubility on the surface of the structure of from about 0.05 mg/L to 100 mg/L.

28. (Withdrawn) The plastic structure of claim 17 wherein the water-insoluble metal biocide has a surface concentration of about 0.01 g/m^2 to about 20 g/m^2.

29. (Withdrawn) The plastic structure of claim 17 wherein the plastic comprises a virgin or recycled resin suitable for extruding or molding such as polyethylene (e.g., low density polyethylene ("LDPE") or high density polyethylene ("HDPE"), polypropylene, polyallomer, polyacetal, polyamide, polyester, polystyrene, polycarbonate, polyurethane, acrylonitrile–

butadiene-styrene ("ABS"), polyvinylchloride, polyvinylfluoride, ethyl-vinyl acetate co-polymer, and combinations thereof.

30. (Withdrawn) The plastic structure of claim 17 which additionally contains at least one cellulosic filler selected from the group consisting of wood chips, wood fibers, wood flour, wood dust or the like, newspaper, rice hulls, straw, peanut shells, alfalfa, cotton, jute and combinations thereof.

31. (Withdrawn) The plastic structure of claim 17 wherein the plastic comprises a virgin or recycled resin suitable for molding selected from the group consisting of a polyester, a polyacrylate, and combinations thereof.

32. (Withdrawn) The plastic structure of claim 17 which additionally comprises reinforcing fibers selected from the group consisting of glass fibers, carbon fibers, polyester fibers, nylon and aramid fibers, cellulosic fibers and combinations thereof, and combinations thereof, thereby providing a reinforced plastic structure.

33. (Previously Presented) A process for incorporating a metal salt of an antimicrobial into a porous inner portion of, an extruded or molded plastic product which comprises the steps of:

(a) extruding or molding a metal-containing plastic-forming composition in an extruder or a mold at an elevated temperature to provide a metal-containing extruded or molded product,

(b) contacting the extruded or molded product from step (a) with an aqueous solution of a water-soluble biocide in order to cause the water soluble biocide to react or chelate with at least a portion of the metal in a porous inner portion, of the warm extruded or molded product, thereby forming an antimicrobially protected plastic product having a water-insoluble metal salt of a biocide in the porous inner portion, thereof.

IX. EVIDENCE APPENDIX

None

X. RELATED PROCEEDINGS APPENDIX

None

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